

Math 53 DIS 108/109
Quiz: February 11, 2015

Name: _____

Show your work fully for all questions. Quiz has **front** and **back** sides.

Problem 1: Find the curve of intersection of these two surfaces; give a vector function describing that curve: The hyperboloid $z = x^2 - y^2$ and the cylinder $x^2 + y^2 = 1$.

Problem 2: Find the derivative of the vector function $\mathbf{r}(t) = (\tan t, \sec t, 1/t^2)$

Problem 3: Find the limit if it exists or show it does not exist.

$$\lim_{(x,y) \rightarrow (0,0)} \frac{x^4 - y^4}{x^2 + y^2}$$

Problem 4: Find the limit if it exists or show it does not exist.

$$\lim_{(x,y,z) \rightarrow (0,0,0)} \frac{xy + yz}{x^2 + y^2 + z^2}$$